



Problem 1

1. A small standard deviation _____

- a) Indicates that the data points are distant from the mean.
- b) Indicates that the data points are distant from the median.
- c) Indicates that data points are close to the mean.
- d) Indicates that data points are close to the median.
- e) None of the other options.

Problem 2

In a class of 25 students, 24 of them took an exam in class and 1 student took a make-up exam the following day. The professor graded the first batch of 24 exams and found an average score of 74 points with a standard deviation of 8.9 points. The student who took the make-up the following day scored 64 points on the exam.

- 2. Does the new student's score increase or decrease the average score? **decrease**
- 3. What is the new average? **73.6**
- 4. Does the new student's score increase or decrease the standard deviation of the scores? **increase**

Problem 3

In each of the following situations, which is the explanatory variable and which is the response variable? Are they categorical or quantitative (quantitative means "numerical")?

- 5. The typical number of calories a person consumes per day and that person's percent of body fat.
 - f) Number of calories consumed per day: response, quantitative. Percent of body fat: explanatory, quantitative.
 - g) Number of calories consumed per day: explanatory, quantitative. Percent of body fat: response, quantitative.
 - h) Number of calories consumed per day: response, quantitative. Percent of body fat: explanatory, categorical.
 - i) Number of calories consumed per day: explanatory, categorical. Percent of body fat: response, categorical.
- 6. Water temperature controlled at different levels and growth (measured by weight) of corals in aquariums.
 - a. Water temperature: response, quantitative. Growth: explanatory, categorical.
 - b. Water temperature: explanatory, categorical. Growth: response, categorical.



- c. Water temperature: response, categorical. Growth: explanatory, quantitative.
- d. Water temperature: explanatory, quantitative. Growth: response, quantitative

Problem 4

Coffee is a leading export from several developing countries. When coffee prices are high, farmers often clear forest to plant more coffee trees. Here are data on prices paid to coffee growers in Indonesia and the rate of deforestation in a national park that lies in a coffee-producing region, for five years:

Price (cents per pound)	Deforestation (percent)
29	0.49
40	1.59
54	1.69
55	1.82
72	3.10

- 7. Coffee is currently priced in dollars. If it were priced in euros, and the dollar prices in the above table were translated into the equivalent prices in euros, would the correlation between coffee price and percent deforestation change?
 - a) The correlation would remain zero, because the two variables are independent
 - b) Yes, units affect correlation
 - c) No, units do not affect correlation
 - d) It is impossible to calculate the correlation, because coffee price is categorical.

Problem 5

A study shows that there is a positive correlation between the size of a hospital (measured by its number of beds (x)) and the median number of days (y) that patients remain in the hospital.

- 8. What lurking variable could be present in this study?
 - a) cost: its more expensive to run larger hospitals.

- b) severity of disease: since large hospitals have better facilities and more doctors to cope with severe illness.
- c) number of visitors: since larger hospitals receive more visitors.
- d) facilities: since larger hospitals have better facilities, patients choose to stay longer

Problem 6

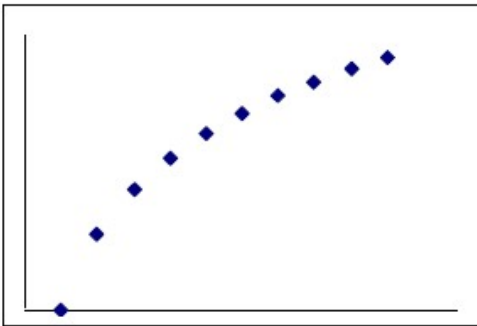
Milk use is positively correlated to cancer rates. While this is not a popular finding within the milk industry, there is a moderately positive correlation with drinking milk and getting cancer (Paulos, 1990). Milk consumption is greater in wealthier countries. In wealthier countries people live longer. Greater longevity means people live long enough to eventually get some type of cancer.

- 9. Which is the response and explanatory variable? **Response – cancer. Explanatory- milk consumption**
- 10. Which is a lurking variable? **Country's measure of wealth.**
- 11. Will you conclude that drinking more milk increases the chance of getting cancer? Explain your reasoning. **No because it is not a randomized experiment.**

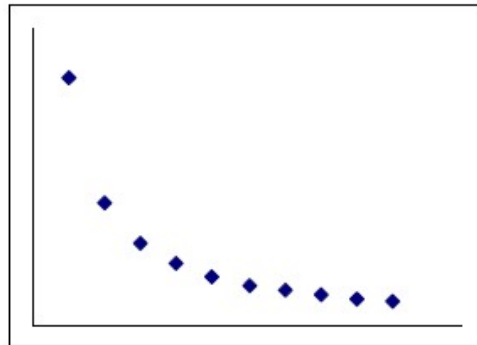
Problem 7

- 12. Which of the following plots will have a correlation coefficient of .85? **D**

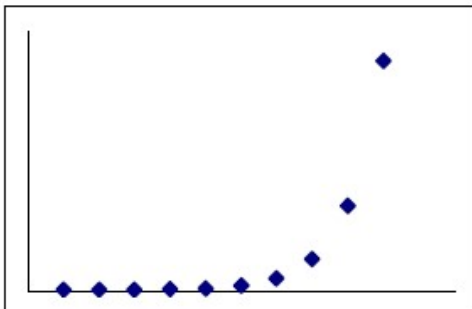
A.



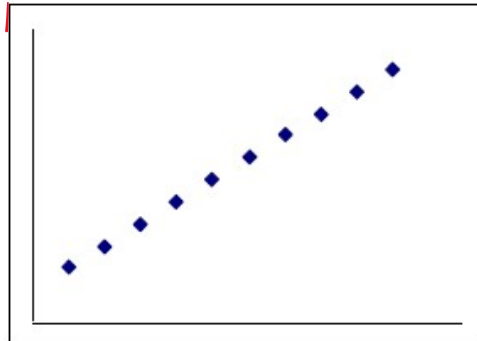
B.



C.



D.





Problem 8

13) The age distribution of students at a community college is given below. 13) _____

<u>Age (years)</u>	<u>Number of students (f)</u>
Under 21	404
21–25	401
26–30	202
31–35	53
<u>Over 35</u>	<u>21</u>
	1081

A student from the community college is selected at random. Find the probability that the student is at least 31. Round approximations to three decimal places.

- A) 74 B) 0.068 C) 0.049 D) 0.932

Problem 9

If you roll a pair of fair dice, what is the probability of?

- (1,1) (1,2) (1,3) (1,4) (1,5) (1,6)
- (2,1) (2,2) (2,3) (2,4) (2,5) (2,6)
- (3,1) (3,2) (3,3) (3,4) (3,5) (3,6)
- (4,1) (4,2) (4,3) (4,4) (4,5) (4,6)
- (5,1) (5,2) (5,3) (5,4) (5,5) (5,6)
- (6,1) (6,2) (6,3) (6,4) (6,5) (6,6)

- a. A = getting a sum of 2 **A={(1,1)}**
P(A) = 1/36
- b. B= getting a sum of 5? **B={ (1,4), (4,1), (3,2), (2,3)}**
- c.
- d. **P(B) = 4/36**